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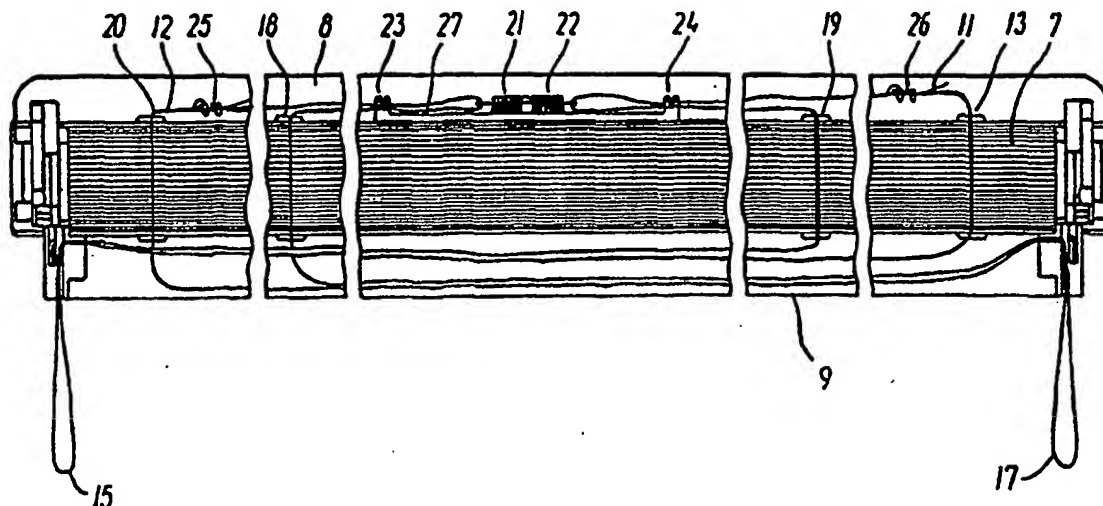
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## (57) Abstract

A window screening device, e.g. a folding blind or a venetian blind, comprises a screening element (7) fastened between a top casing (8) and a slidable bottom beam (9) as well as parallel guidance means in the form of a cord arrangement with guidance cords (11, 12), which are routed through rows of openings (13, 18-19) in the screening element (7), the bottom beam (9), and a side guide strip (14) to one end of a sash bottom member (2) and from there back to the top casing (8). In the top casing each guidance cord (11, 12) is connected with one end of a tension spring (21, 22), the other end of which is fastened to a stationary point. Free ends of the two cords (11, 12) in each side of the top casing (8) are joined in a slidable (flowing) junction (25, 26), and in connection with each tension spring (21, 22) there is a stopping device (23, 24) in the top casing for limiting the travelling of the spring.

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# A window screening device

The invention relates to a window screening device, particularly for a skylight or a similar permanent or temporary oblique window, comprising a screening element, particularly of pleated material, fastened between a top casing firmly attached to a top member of the window sash and a slidable bottom beam as well as guidance means, comprising a cord arrangement with guidance cords, which are individually routed from the top casing through one of at least two rows of openings in the screening element and further through the bottom beam and a side guide strip for the screening element to one end of a bottom member of the window sash and from there back to the top casing, each guidance cord being connected in the top casing with one end of a tension spring the other end of which is fastened to a stationary point in the top casing.

A window screening device of this kind is known from EP patent No. 015 043. The purpose of the cord arrangement is to ensure parallelism between the top casing and the bottom beam when the screening element is parked in different positions in the window opening and to the extent possible also to ensure parallel guiding during operation of the screening element, which is performed using a handle placed in the middle of the bottom beam.

By attempting to pull the bottom beam by one of its ends near a side guide, the bottom beam will, however, be pulled askew, as the spring-loaded cord control in the opposite end of the bottom beam, as a result of friction at the positions where the cord changes direction, prevents the bottom beam from moving and so to speak locks the concerned end of the bottom beam.

For counter-acting such locking at skew load on the bottom beam, the application of sufficiently tight springs could be considered, which at skew load will make the cord tension of the cord control at the 5 opposite side almost momentarily constant, even though the bottom beam is affected by a tug in one end. Such solution has, however, turned out to be accompanied by unacceptable wear and tear of cords and cord routings, which normally consist of plastic bushes, or by a 10 friction at bush routings and other places where a cord changes direction which is so high that the operating comfort is considerably reduced.

According to the invention, these disadvantages are avoided in a simple way in that two cord pieces in each 15 side of the screening element are routed through the same or different rows of openings to the top casing, in which free ends of each cord piece are joined in a slidable (flowing) junction, one of said free ends being connected with said one end of the tension spring, each 20 cord piece being routed, from its respective row of openings in one side of the screening element through the bottom beam and the side guide strip in the opposite side of the window to the end of said sash bottom member situated at this side, and from there back through the 25 same side guide strip, the bottom beam, and a row of openings in said one side of the screening element to the slidable (flowing) junction in the opposite side of the top casing, a stopping device being provided in each side of the top casing in connection with the tension 30 spring for limiting the travelling of the spring.

The limitation of the travelling of the tension spring by means of said stop and the slidable or flowing junction of the cord ends in each side of the top casing results in that the bottom beam can be permitted a 35 considerable deviation at one-sided skew load from its

normal position parallel to the top casing, without locking occurring.

Hereby the invention provides the possibility of using an operating handle extending the entire width of the bottom beam.

Compared to the design in accordance with above mentioned EP patent, the invention furthermore has the advantage that mounting of the guidance cord arrangement does not require intervention in the sash bottom member, which to a considerable extent eases after-mounting.

The invention will now be explained in detail with reference to the drawing, in which

fig. 1 shows a skylight with a window screening device in the form of a folding blind and

fig. 2 a guidance cord arrangement in an embodiment of the window screening device according to the invention.

In figure 1 is shown a skylight of by it self conventional type having a window sash comprising at top member 1 and a bottom member 2 as well as two side members 3 and 4. The sash top member 1 is in a known manner, not shown, provided with closure fittings for the window, which is operated by means of an operating handle 5 extending the entire width of the window, which operating handle is fastened to a pivotable flap 6, covering a ventilation opening formed in the sash top member 1 for providing ventilation in the closed position of the window.

For blinding, the window is provided with a window screening device according to the invention, in the example shown a folding blind with a blind element of pleated material. The blind element 7 is mounted between a top casing 8, which is firmly connected to the sash top member 1, and a bottom beam 9, which can be brought

up and down in the window opening for blinding or screening of a large or small part thereof.

In the embodiment shown the folding blind 7 is adapted to manual hoisting and lowering by means of an operating handle 10 fastened to the bottom beam 9, which operating handle, like the operating handle 5, extends substantially the entire width of the window.

The hoisting and lowering can be carried out by means of a cord control, not shown, which in a known way can be performed in such a way that the bottom beam 9 can be parked in any intermediate position between a fully hoisted position of the blind 7, the bottom beam 9 being placed immediately below the top casing 8, and a completely drawn position, the bottom beam 9 coming into contact with the sash bottom member 2.

Likewise, the blind 7 can in a manner known per se be adapted to motorized operation instead of manual operation.

To ensure parallelism between the top casing 8 and the bottom beam 9 at arbitrary positions of the bottom beam as well as, to the extent possible, to ensure parallel guiding of the bottom beam during hoisting or lowering, the window screening device according to the invention is provided with a guidance cord arrangement with a number of guidance cords, of which figure 1 shows four cords which are routed through rows of openings provided in the individual folds of the pleated material in the blind element 7.

The detailed construction of the guidance cord arrangement will be explained in the following.

Figure 2 shows the window screening device according to the invention in a fully hoisted position, the folding blind element 7 being completely folded and the bottom beam 9 being placed close to the top casing 8.

The guidance cord arrangement comprises two pieces of cord, which in the example shown - with a relatively wide window, where four rows of openings are provided in the blind element 7, said rows of openings being  
5 placed symmetrically around a vertical central axis in the blind element - are routed through their respective row of openings in both sides of the blind element 7.

In this way, the fully pulled up guidance cord 11, starting from the top casing, is routed through the  
10 outermost right row of openings 13 of the blind element 7 and from there through the bottom beam 9 to the opposite left side thereof, from where it is routed hidden in a side guide strip 14 fastened to the sash side member 3 - see fig. 1 - to a junction 15 with the  
15 sash bottom member 2 in the left side thereof.

The cord piece 11 is from there routed back through the same side guide strip 14 and the bottom beam 9 and up through the row of openings 19 in the blind 7.

The other cord piece 12, shown by a thin line, is  
20 routed from the top casing 8 through the innermost row of openings 18 in the left side of the blind element 7 and the bottom beam 9 to a junction 17 on the sash bottom member 2 in the right side and back through the bottom beam to the outermost row of openings 20 in the  
25 left side of the blind element 7.

In the top casing 8 each of the cord pieces 11 and 12, as it is known in principle from above mentioned EP patent, is connected with one end of a tension spring 21 and 22, respectively, the other end of which is fixed  
30 to a point in the top casing.

According to the invention, the special features of the guidance cord arrangement are that for each of the tension springs 21 and 22 in the top casing 8 there is a stopping device 23 and 24, respectively, for  
35 limiting the travelling of the spring, and that the free

ends of the cord pieces 11 and 12 in each side of the top casing 8 are joined in a freely slidable or flowing junction 25 and 26, respectively, which can be provided either as an ordinary knot or by means of a specially  
5 designed joint clip.

In the embodiment shown, the two tension springs 21 and 22 are fastened in a joint spring holder 27, which is fastened approximately in the middle of the top casing 8 and is provided with end portions forming said  
10 stopping devices 23 and 24.

In the bottom of the top casing 8, opposite the rows of openings 13 and 18-20 of the blind element 7, cord routing bushes are fastened, which together with the stopping devices 23 and 24 limit the possibility of  
15 moving the slidable or flowing junction 25 and 26, respectively, between the ends of the cord pieces 11 and 12.

At a skew action on the operating handle 10, e.g. in the very right side of this, the part of the cord  
20 piece 11 situated in the top casing, which cord is routed through the rows of openings in the side in question of the blind element 7, will perform a tension of the spring as a consequence of the friction between the cord piece 11 and the cord routing bushes for the  
25 rows of openings 13 and 19, until the end in question of the tension spring 22 comes into contact with the stopping device 24.

At a similar action at hoisting from a parked intermediate position of the bottom beam 9, a similar  
30 effect will take place in the opposite side of the top casing.

This travelling of one of the tension springs until it comes into contact with one of the stopping devices will, in itself, be decisive for how much the bottom



beam 9 can be affected askew from the position parallel to the top casing 8 before it locks.

This locking at skew action on the operating handle 10 will, however, only affect the part of the cord piece 5 11 or 12 which is in the one side of the top casing 8, depending on whether lowering or hoisting is in question, and by appropriate dimensioning the locking will not cause blocking of the opposite side of the blind element 7.

10 The connection between the cord pieces 11 and 12 and the slidable ends of the tension springs 21 and 22 is provided in that the cords extend through eyes at the respective ends of the tension springs, so that the cords can pass freely through these eyes.

15 Although in the above the invention is described and explained referring to a folding blind as a screening element, it can be used also in connection with other types of a window screening devices, particularly venetian blinds.

20 Also other modifications are possible compared to the embodiment shown and described. As an example, the screening element, e.g. for a narrow window, can be provided with only two rows of openings instead of four. The two guidance cords are thereby routed through the  
25 same row of openings in each side of the screening element.

## C L A I M S

1. A window screening device, particularly for a skylight or a similar permanent or temporary oblique window, comprising a screening element (7), particularly of pleated material, fastened between a top casing (8) 5 of pleated material, fastened between a top casing (8) firmly attached to a top member (1) of the window sash and a slidable bottom beam (9) as well as guidance means, comprising a cord arrangement with guidance cords (11, 12), which are individually routed from the top 10 casing (8) through one of at least two rows of openings (13, 18-20) in the screening element (7) and further through the bottom beam (9) and a side guide strip (14) for the screening element (7) to one end of a bottom member (2) of the window sash and from there back to the 15 top casing (8), each guidance cord (11, 12) being connected in the top casing with one end of a tension spring (21, 22), the other end of which is fastened to a stationary point in the top casing, characterized in that two cord pieces (11, 12) in each side of the 20 screening element (7) are routed through the same or different rows of openings (13, 18-20) to the top casing (8), in which free ends of each cord piece (11, 12) are joined in a slidable (flowing) junction (25, 26), one of said free ends being connected with said one end of 25 the tension spring (21, 22), each cord piece (11, 12) being routed, from its respective row of openings (13, 18) in one side of the screening element (7) through the bottom beam (9) and the side guide strip (14, 16) in the opposite side of the window to the end of said sash 30 bottom member (2) situated at this side, and from there back through the same side guide strip (14, 16), the bottom beam (9), and a row of openings (19, 20) in said one side of the screening element (7) to the slidable (flowing) junction (26) in the opposite side of the top 35 casing (8), a stopping device (23, 24) being provided

in each side of the top casing in connection with the tension spring (21, 22) for limiting the travelling of the spring.

2. A window screening device according to claim 1, 5 characterized in that each tension spring (21, 22) is fastened in a spring holder forming said stop (23, 24).

3. A window screening device according to claim 2, characterized in that the two tension springs (21, 22) are fastened in a joint spring holder (27).

10 4. A window screening device according to one of the above claims, characterized in that cord routing bushes in the top casing (8) opposite at least one row of openings (13-20) in each side of the screening element form a stop of the movement of said slidable 15 (sliding) junction (25, 26) in each side of the top casing (8).

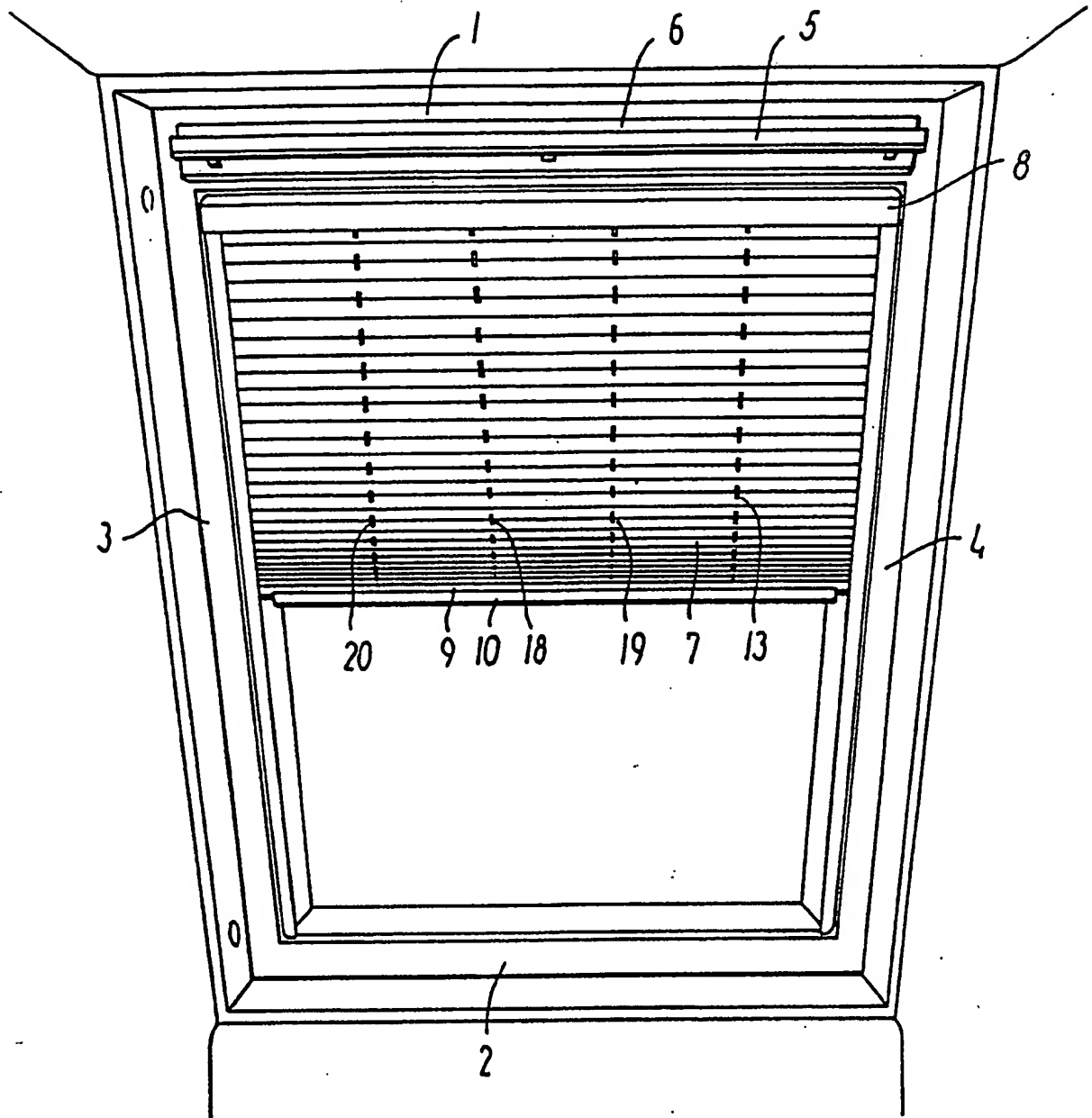


FIG. 1

SUBSTITUTE SHEET

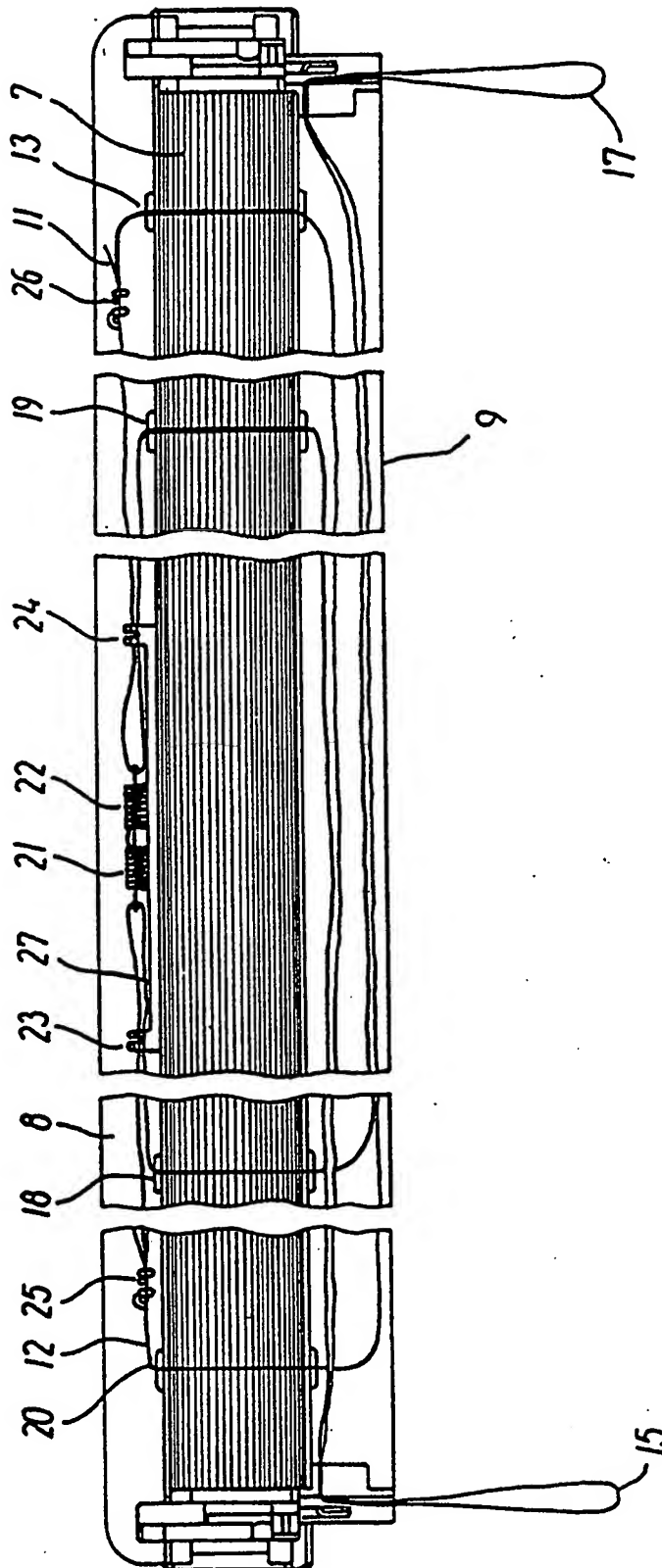


FIG. 2

## A. CLASSIFICATION OF SUBJECT MATTER

IPC5: E06B 9/32, E06B 9/327

According to International Patent Classification (IPC) or to both national classification and IPC

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Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP, A1, 0015043 (VEROSOL B.V.), 3 Sept 1980 (03.09.80), figure 3  --	1
A	US, A, 4557309 (R.S. JUDKINS), 10 December 1985 (10.12.85), figures 1,3, abstract  -- -----	1

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Date of the actual completion of the international search

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

02/07/94

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A1- 0015043	03/09/80	SE-T3- 0015043 AT-E,T- 6379 NL-A- 7901549	15/03/84 29/08/80
US-A- 4557309	10/12/85	NONE	